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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Hai Tao

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EXAMINER

NAKHJAVAN, SHERVIN K

ART UNIT

PAPER NUMBER

2621

DATE MAILED: 06/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/615,971

Applicant(s)

TAO ET AL.

Examiner

Shervin Nakhjavan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 8-14 and 18 is/are rejected.
- 7) ☒ Claim(s) 5-7 and 15-17 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

Response to Arguments

1. Applicant's arguments filed 3-22-04 have been fully considered but they are not persuasive. Applicant argues that Cham et al. (US 6,353,679) does not teach step of "selecting an initial configuration comprising a plurality of objects" of claims 1 and 11, specifically what Cham et al. is teaching with regards to Column 6, Lines 16-18 is only to identify mathematical state space starting points to initiate a prediction for the next frame of data and further arguing that such starting values are not an initial configuration of objects. In addition applicant argues that on page 3 of the specification, lines 27-30, a configuration is referred to as group of objects and predicting of a current configuration is predicting a group of objects and the current configuration may be different than the initial configuration however, examiner disagrees. While claims are interpreted in light of the specification, additional features or interpretations cannot be read into the claims that are not already in there. In the instant situation, the word configuration in the claim has been given it's broad interpretation being an arrangement or setup of *elements* or *parts* which incidentally is consistent with the cited interpretation of applicant's invention as disclosed in the specification on page 3 above with objects being elements or parts. Examiner also agrees that the passage discusses identification of initial starting points however, upon identifying of the starting points, Cham et al. further teaches selecting of only *certain* points by a selection criteria of *the* starting points or seed points (Column 6, Lines 31-33) that are stronger to track. Further in Column 6, Lines 34-46 Cham discusses alternative embodiments of the selection step, such as selection step of the probability density $p(x|z)$ having only the highest ten peaks

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which this selection criteria and it's peaks is inherently considered a configuration that has elements or objects within it for tracking of each frame. Regarding claim 9, applicant argues that Cham et al. does not teach object configuration or individual object states and the state space starting points are not an object configuration and furthermore the state space starting points do not represent an individual object states. Again, the word "configuration" has been given its broad interpretation, which is also consistent with applicant's interpretation of the word as discussed above. Based on selection criteria of best modes, points or peaks of the probability density (Column 6, Lines 31-46) and it's alternative embodiments, the configuration is *object based* configuration such as Lines 37-39 of the same column which only selects the high ten points or *objects* and performs the steps discussed in lines 8-29 of the same column such as state prediction, only with regards to the selected points or objects in the given configuration or setup of points. Therefore, Cham et al. fully anticipates the requirement of claims 1, 9 and 11.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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3. Claims 1-4, 8-14 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Cham et al. (US 6,353,679).

Regarding claims 1-18, Cham teaches, limitation of claim 1, a method for tracking multiple objects in a video sequence (Column 6, Lines 42-46) comprising: selecting an initial configuration comprising a plurality of objects (Column 6, Lines 29-33, where a selection criteria of the points, modes or peaks are implemented which includes plurality of points being the objects and the whole setup is considered a configuration of a selected number of points); predicting a current configuration (Column 6, Lines 10-13, where the predictor 302 predicts the current state or configuration); and computing a likelihood for the current configuration (Column 6, Lines 19-29, where the likelihood of the predicted current state or configuration is computed based on the received current frame of data from the sensor);

limitation of claim 2, said predicting step comprises performing an object level prediction (Column 6, Lines 10-13, where the prediction is based on hypothesis points corresponding to objects);

limitation of claim 3, said prediction step comprises performing a configuration level prediction (Column 6, Lines 31-33, where the configuration level prediction is performed when only the best modes are selected);

limitation of claim 4, said configuration level prediction handles object addition and deletion from a current configuration (Column 6, Lines 29-42, where certain modes are deleted based on i.e. selecting only the highest ten peaks for further analysis and

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further by constantly receiving new frame current data and the predicted current data, other peaks could be detected and added to the tracking);

limitation of claim 8, multiple objects in a video sequence are represented by said configuration comprising a plurality of modeled objects (Column 6, Lines 22-28, where the state vector x describes a model by indicating a point in state space which specifies all parameters of the object model according to column 4, Lines 35-39);

limitation of claim 9, a method of producing probability distributions of states for multiple objects in a video sequence (Column 6, Lines 8-29, where the $p(x|z)$ is the probability distribution of states) comprising: performing hierarchical sampling of at least one frame of video in said video sequence, wherein said sampling is performed in an object configuration and individual object states (Column 6, Lines 31-46, based on selection criteria of best modes, points or peaks of the probability density and its alternative embodiments, the *configuration* is object configuration such as discussed in lines 37-39 of the same column which upon a sampling, only the high ten points or *objects* are selected and performs the steps discussed in lines 8-29 of the same column such as state prediction, only with regards to the selected points or objects in the given configuration or setup of points in each frame); and repeating said sampling for each frame in said video sequence to track objects within the video sequence (Column 6, Lines 16-33, where the sampling of the predicted states of model vectors of the objects repeated for each new frame of the video sequence for tracking of objects)

limitation of claim 10, said object configuration represents a plurality of objects within a scene (Column 10, Line 54 through Column 11, Line 25, where the objects for

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tracking in this instant is the parts of the body of the man which are itemized and tracked according to multi-hypothesis algorithm);

limitations of programming claims 11-14 and 18 corresponding to method claims 1-4 and 8, respectively, are inherently taught throughout the teachings of instruction for processing images in the computer system of figure 22, (Column 20, Lines 8-27).

Allowable Subject Matter

4. Claims 5-7 and 15-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record specifically Cham et al. does not teach *maximizing the percentage and minimizing the number* to identify an optimal current configuration of claims 5 and 15, combined with other features and elements of the claims.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shervin Nakhjavan whose telephone number is (703) 306-5916. The examiner can normally be reached on Monday through Friday from 8:00 am to 5:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau, can be reached at (703) 305-4706.

Any response to this action should be mailed to:

Assistant Commissioner for Patents
Washington, DC 20231

Or faxed to:

(703) 872-9306 for *formal* communications, please mark "**EXPEDITED PROCEDURE**"

or:

for *informal* or *draft* communications; please label "**PROPOSED**" or "**DRAFT**".

Hand delivered responses should be brought to Crystal Park 2, 2121 Crystal drive, Arlington, VA, sixth floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Tech center 2700 customer service office (703) 306-0377.

Shervin Nakhjavan *S.N.*
Patent Examiner
Group Art Unit 2621
May28, 2004.



**ANDREW W. JOHNS
PRIMARY EXAMINER**